<u>**LISTING OF CLAIMS:**</u>

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An encoding device ~~characterized by~~ comprising:

two-dimensional Haar wavelet transforming means for dividing a two-dimensional signal into subbands as a plurality of frequency regions <u>in a predetermined signal scanning sequence to transform a predetermined number of the two-dimensional signals into a predetermined number of coefficients</u>;

coefficient extracting means for, whenever said two-dimensional Haar wavelet transforming means transforms a predetermined number of two-dimensional signals into a predetermined number of coefficients <u>in the course of the transform process</u>, extracting sets of AC-component coefficients [[of]] <u>from the</u> coefficients obtained by <u>the</u> transform, for every predetermined number of sets of coefficients which belong to [[the]] <u>a same hierarchy and a</u> same spatial position;

coefficient encoding means for encoding and concatenating <u>the thus encoded coefficient sets in a sequence the coefficient sets were extracted in the same hierarchy to generate</u> ~~the extracted AC-component coefficient sets; and generating~~ a code sequence of a high-frequency subband;

initial coefficient encoding means for encoding and concatenating a DC component as a lowest-frequency subband~~, and generating the~~ <u>to generate a</u> code sequence of the lowest-frequency subband; and

code output means for outputting the code sequence of the lowest-frequency subband, and sequentially outputting the code sequence of the high-frequency subband generated by said coefficient encoding means.

2. (Currently Amended) An encoding device according to claim 1, ~~characterized in that~~ wherein said predetermined signal scanning sequence represents a sequential order of scan lines of the two-dimensional signal, and said coefficient extracting means sequentially extracts a predetermined number of coefficient sets at a time in a scan line direction of the two-dimensional signal.

3. (Original) An encoding device according to claim 1, characterized in that said coefficient extracting means sequentially extracts coefficient sets one by one.

4. (Original) An encoding device characterized by comprising:

element extracting means for sequentially extracting 2m × 2 (m is an integer: m ≥ 1) spatially adjacent elements from a two-dimensional signal;

two-dimensional Haar wavelet transforming means for dividing the 2m × 2 elements into a plurality of subband coefficient sets;

coefficient encoding means for encoding and concatenating the AC-component coefficient sets obtained by transform by said two-dimensional Haar wavelet transforming means, and generating a code sequence of a high-frequency subband;

initial coefficient encoding means for encoding and concatenating a DC component as a lowest-frequency subband, and generating the code sequence of the lowest-frequency subband; and

code output means for outputting the code sequence of the lowest-frequency subband, and sequentially outputting the code sequence of the high-frequency subband generated by said coefficient encoding means.

5. (Previously Presented) An encoding device according to claim 1, characterized in that

each coefficient comprises a plurality of components, and

said coefficient encoding means encodes each component of a coefficient, and generates a code by concatenating a code of each component.

6. (Previously Presented) An encoding device according to claim 4, characterized in that

each coefficient comprises a plurality of components, and

said coefficient encoding means encodes each component of a coefficient, and generates a code by concatenating a code of each component.

7. (Previously Presented) An encoding device according to claim 1, characterized in that

each coefficient comprises a plurality of components, and

said coefficient encoding means encodes each component of a coefficient, and generates a code by concatenating a code of each coefficient.

8. (Previously Presented) An encoding device according to claim 4, characterized in that

each coefficient comprises a plurality of components, and

said coefficient encoding means encodes each component of a coefficient, and generates a code by concatenating a code of each coefficient.

9.–21. (Cancelled)

22. (Withdrawn) An encoding device according to claim 1, characterized by further comprising

coefficient thinning map generating means for generating a coefficient thinning map in which resolution at each spatial coordinate of the two-dimensional signal is set, and

updated region detecting means for detecting a updated region from a plurality of sequential frames of a sequence of a plurality of frames forming the two-dimensional signal, and obtaining a changing period during which a signal value changes in each partial region from said plurality of sequential frames,

wherein said coefficient thinning map generating means sets the resolution on the basis of the changing period, and generates a coefficient thinning map in which resolution of the updated region differs from resolution of a region other than the updated region, and

said coefficient extracting means refers to the coefficient thinning map, and extracts coefficients by thinning the coefficients to the resolution set for the coordinate.

23. (Withdrawn) An encoding device according to claim 4, characterized by further comprising

coefficient thinning map generating means for generating a coefficient thinning map in which resolution at each spatial coordinate of the two-dimensional signal is set, and

updated region detecting means for detecting a updated region from a plurality of sequential frames of a sequence of a plurality of frames forming the two-dimensional signal, and obtaining a changing period during which a signal value changes in each partial region from said plurality of sequential frames,

wherein said coefficient thinning map generating means sets the resolution on the basis of the changing period, and generates a coefficient thinning map in which resolution of the updated region differs from resolution of a region other than the updated region, and

said element extracting means refers to the coefficient thinning map, and extracts coefficients by thinning the coefficients to the resolution set for the coordinate.

24. (Withdrawn) An encoding device according to claim 22, characterized in that said coefficient thinning map generating means sets low resolution in a region in which the changing period is long.

25. (Withdrawn) An encoding device according to claim 23, characterized in that said coefficient thinning map generating means sets low resolution in a region in which the changing period is long.

26.–37. (Cancelled)

38. (Withdrawn) An encoding device according to claim 1, characterized by further comprising

coefficient quantization map generating means for generating a coefficient quantization map in which quantization accuracy at each spatial coordinate of the two-dimensional signal is set,

coefficient quantizing means for quantizing a coefficient to quantization accuracy corresponding to a spatial coordinate of the coefficient by referring to the coefficient quantization map, and

updated region detecting means for detecting a updated region from a plurality of sequential frames of a sequence of a plurality of frames forming the two-dimensional signal, and obtaining a changing period during which a signal value changes in each partial region from said plurality of sequential frames,

wherein said coefficient quantization map generating means sets the quantization accuracy on the basis of the changing period, and generates a coefficient quantization map in which quantization accuracy of the updated region differs from resolution of a region other than the updated region, and

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said coefficient encoding means encodes a set of the quantized coefficients.

39. (Withdrawn) An encoding device according to claim 4, characterized by further comprising

coefficient quantization map generating means for generating a coefficient quantization map in which quantization accuracy corresponding to each spatial coordinate of the two-dimensional signal is set,

coefficient quantizing means for quantizing a coefficient set to quantization accuracy corresponding to a spatial coordinate of the coefficient set by referring to the coefficient quantization map, and

updated region detecting means for detecting a updated region from a plurality of sequential frames of a sequence of a plurality of frames forming the two-dimensional signal, and obtaining a changing period during which a signal value changes in each partial region from said plurality of sequential frames,

wherein said coefficient quantization map generating means sets the quantization accuracy on the basis of the changing period, and generates a coefficient quantization map in which quantization accuracy of the updated region differs from resolution of a region other than the updated region, and

said coefficient encoding means encodes a set of the quantized coefficients.

40. (Withdrawn) An encoding device according to claim 38, characterized in that said coefficient thinning map generating means sets low quantization accuracy in a region in which the changing period is long.

41. (Withdrawn) An encoding device according to claim 39, characterized in that said coefficient thinning map generating means sets low quantization accuracy in a region in which the changing period is long.

42.–45. (Cancelled)

46. (Withdrawn) An encoding device according to claim 1, characterized by further comprising

coefficient thinning map generating means for generating a coefficient thinning map in which resolution at each spatial coordinate of the two-dimensional signal is set, and

updated region detecting means for detecting, as a updated region, an overlapping region of a region to be encoded of a preceding frame and a region to be encoded of a succeeding frame of a sequence of a plurality of frames forming the two-dimensional signal,

wherein said coefficient thinning map generating means generates a coefficient thinning map in which resolution of the updated region differs from resolution of a region other than the updated region, and

said coefficient extracting means refers to the coefficient thinning map, and extracts coefficients by thinning the coefficients to the resolution set for the coordinate.

47. (Withdrawn) An encoding device according to claim 4, characterized by further comprising

coefficient thinning map generating means for generating a coefficient thinning map in which resolution at each spatial coordinate of the two-dimensional signal is set, and

updated region detecting means for detecting, as a updated region, an overlapping region of a region to be encoded of a preceding frame and a region to be encoded of a succeeding frame of a sequence of a plurality of frames forming the two-dimensional signal,

wherein said coefficient thinning map generating means generates a coefficient thinning map in which resolution of the updated region differs from resolution of a region other than the updated region, and

said element extracting means refers to the coefficient thinning map, and extracts coefficients by thinning the coefficients to the resolution set for the coordinate.

48. (Withdrawn) An encoding device according to claim 1, characterized by further comprising

coefficient quantization map generating means for generating a coefficient quantization map which represents quantization accuracy at each spatial coordinate of the two-dimensional signal, coefficient quantizing means for quantizing coefficients to quantization accuracy corresponding to each spatial coordinate of the coordinates with reference to the coefficient quantization map, and

updated region detecting means for detecting, as a updated region, an overlapping region of a region to be encoded of a preceding frame and a region to be encoded of a succeeding frame of a sequence of a plurality of frames forming the two-dimensional signal,

wherein said coefficient thinning map generating means generates a coefficient quantization map in which quantization accuracy of the updated region differs from quantization accuracy of a region other than the updated region, and

said coefficient encoding means encodes a set of the quantized coefficients.

49. (Withdrawn) An encoding device according to claim 4, characterized by further comprising

coefficient quantization map generating means for generating a coefficient quantization map in which quantization accuracy corresponding to each spatial coordinate of the two-dimensional signal is set,

coefficient quantizing means for quantizing a coefficient set to quantization accuracy corresponding to a spatial coordinate of the coefficient set by referring to the coefficient quantization map, and

updated region detecting means for detecting, as a updated region, an overlapping region of a region to be encoded of a preceding frame and a region to be encoded of a succeeding frame of a sequence of a plurality of frames forming the two-dimensional signal,

wherein said coefficient quantization map generating means generates a coefficient quantization map in which quantization accuracy of the updated region differs from quantization accuracy of a region other than the updated region, and

said coefficient encoding means encodes a set of the quantized coefficients.

50. (Original) A decoding device which sequentially receives coefficients of a plurality of subbands obtained by two-dimensional Haar wavelet transform as a code sequence of the subband, from a code sequence of a lowest-frequency subband to a code sequence of a high--frequency subband, characterized by comprising:

initial coefficient decoding means for decoding a coefficient of the lowest-frequency subband from a code sequence corresponding to the lowest-frequency subband, and generating a two-dimensional signal of the lowest-frequency subband;

coefficient decoding means for decoding sets of AC-component coefficients for every predetermined number of sets of coefficients which belong to the same spatial position in a plurality of subbands which belong to a wavelet transform level of the same hierarchy from the high-frequency subband code sequence following the lowest-frequency subband code sequence; and

inverse wavelet transforming means for performing two-dimensional Haar inverse wavelet transform whenever the coefficient set is decoded, thereby generating the original two-dimensional signal.

51. (Original) A decoding device according to claim 50, characterized in that said coefficient decoding means sequentially decodes a predetermined number of coefficient sets at a time in a scan line direction of the two-dimensional signal.

52. (Original) A decoding device according to claim 51, characterized in that said coefficient decoding means sequentially decodes the coefficient sets one by one.

53. (Previously Presented) A decoding device according to claim 52, characterized in that each coefficient comprises a plurality of components, and

said coefficient decoding means decodes each component of a coefficient, and concatenates each component.

54. (Original) A decoding device according to claim 52, characterized in that each coefficient comprises a plurality of components, and

said coefficient decoding means decodes each component of a coefficient.

55.–73. (Cancelled)

74. (Currently Amended) An encoding program embodied on a computer-readable medium for causing a computer to execute the steps of:

dividing a two-dimensional signal into subbands as a plurality of frequency regions in a predetermined signal scanning sequence to transform a predetermined number of the two-dimensional signals into a predetermined number of coefficients by applying a two-dimensional Haar wavelet transform;

encoding and concatenating a DC component as a lowest-frequency subband, and generating the to generate a code sequence of the lowest-frequency subband;

extracting, whenever said two-dimensional Haar wavelet transforming means transforms a predetermined number of two-dimensional signals into a predetermined number of coefficients in the course of the transform process, sets of AC-component coefficients [[of]] from the coefficients obtained by the transform, for every predetermined number of sets of coefficients which belong to [[the]] a same hierarchy and a same spatial position;

encoding and concatenating the thus encoded coefficient sets in a sequence the coefficient sets were extracted in the same hierarchy to generate the extracted AC-component coefficient sets, and generating a code sequence of a high-frequency subband; and

outputting the code sequence of the lowest-frequency subband, and sequentially outputting the code sequence of the high-frequency subband.

75. (Previously Presented) An encoding program embodied on a computer-readable medium for causing a computer to execute the steps of:

sequentially extracting 2m × 2 (m is an integer: m ≥ 1) spatially adjacent elements from a two-dimensional signal;

dividing the 2m × 2 elements into a plurality of subband coefficient sets by two-dimensional Haar wavelet transform;

encoding and concatenating the AC-component coefficient sets obtained by two-dimensional Haar wavelet transform, and generating a code sequence of a high-frequency subband;

encoding and concatenating a DC component as a lowest-frequency subband, and generating the code sequence of the lowest-frequency subband; and

outputting the code sequence of the lowest-frequency subband, and sequentially

outputting the code sequence of the high-frequency subband.

76.–83. (Cancelled)

84. (Previously Presented) A decoding program embodied on a computer-readable medium for

causing a computer to execute the steps of:

sequentially receiving coefficients of a plurality of subbands obtained by two-dimensional

Haar wavelet transform as a code sequence of the subband, from a code sequence of a

lowest-frequency subband to a code sequence of a high--frequency subband;

decoding a coefficient of the lowest-frequency subband from a code sequence

corresponding to the lowest-frequency subband, and generating a two-dimensional signal of the

lowest-frequency subband;

decoding sets of coefficients for every predetermined number of sets of coefficients

which belong to the same spatial position in a plurality of subbands which belong to a wavelet

transform level of the same hierarchy from a high-frequency subband code sequence following

the lowest-frequency subband code sequence; and

performing two-dimensional Haar inverse wavelet transform whenever the coefficient set

is decoded, thereby generating the original two-dimensional signal.

85. (Currently Amended) A communication terminal characterized by comprising:

image input means;

communicating means for transmitting and receiving an encoded image signal;

two-dimensional Haar wavelet transforming means for dividing an image signal to be

transmitted, which is input by said image input means, into subbands as a plurality of frequency

regions in a predetermined signal scanning sequence to transform a predetermined number of the

two-dimensional signals into a predetermined number of coefficients;

coefficient extracting means for, whenever said two-dimensional Haar wavelet

transforming means transforms a predetermined number of two-dimensional signals into a

predetermined number of coefficients in the course of the transform process, extracting sets of

AC-component coefficients [[of]] from the coefficients obtained by the transform, for every

predetermined number of sets of coefficients which belong to [[the]] a same hierarchy and a

same spatial position;

coefficient encoding means for encoding and concatenating the thus encoded coefficient

sets in a sequence the coefficient sets were extracted in the same hierarchy to generate the

extracted AC-component coefficient sets, and generating a code sequence of a high-frequency

subband;

initial coefficient encoding means for encoding and concatenating a DC component as a

lowest-frequency subband, and generating the to generate a code sequence of the

lowest-frequency subband;

code output means for outputting the code sequence of the lowest-frequency subband to

said communication means, and sequentially outputting the code sequence of the high-frequency

subband generated by said coefficient encoding means to said communication means;

initial coefficient decoding means for decoding a coefficient of the lowest-frequency

subband from a code sequence corresponding to the lowest-frequency subband of the received

image signal, and generating an image signal of the lowest-frequency subband;

coefficient decoding means for decoding sets of AC-component coefficients for every predetermined number of sets of coefficients which belong to the same spatial position in a plurality of subbands which belong to a wavelet transform level of the same hierarchy from the high-frequency subband code sequence following the lowest-frequency subband code sequence;

inverse wavelet transforming means for performing two-dimensional Haar inverse wavelet transform whenever the coefficient set is decoded, thereby generating the original received image signal; and

image display means for displaying a received image on the basis of the received image signal.